Rod catches of Usk salmon and stock status in 2023

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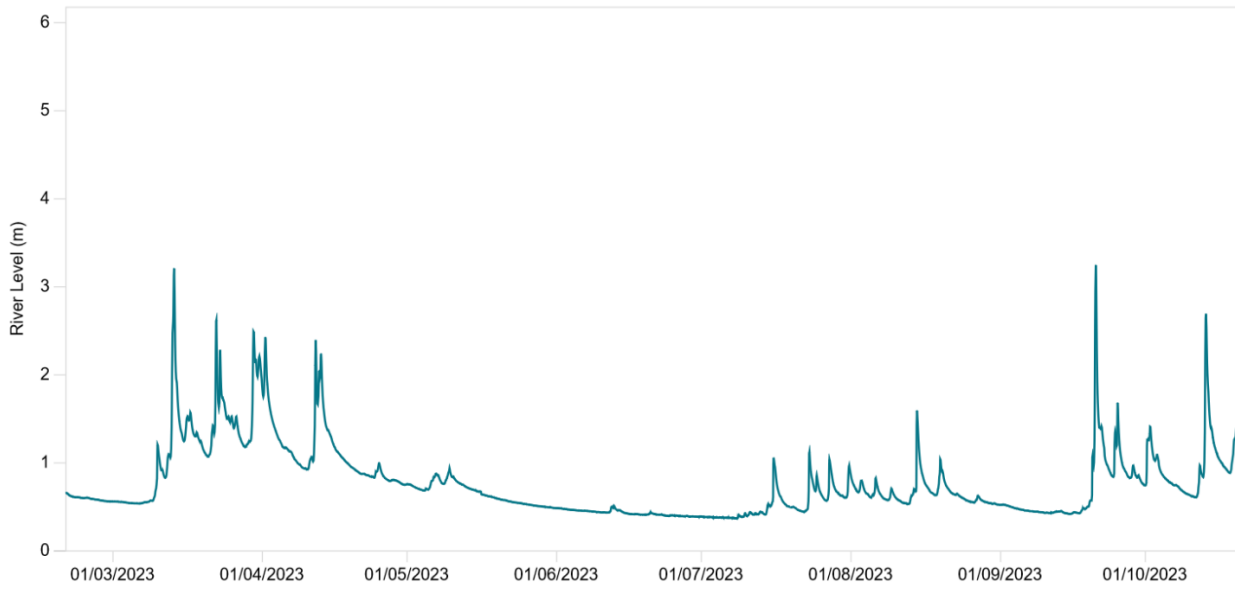
Summary:

- Conditions for fishing and salmon migration were much improved. Nonetheless, they were poor from mid-May to mid-July delaying the main salmon run potentially with significant loss.
- Many fisheries closed during hot weather in June and September to avoid mortalities after catch-and-release.
- Rod catches were as bad as those in 2022, the worst on record. The declared rod catch for the whole river, when available next year from rod licence catch returns, is predicted to be between 68 and 94 salmon, best estimate 78.
- Catches at Index fisheries peaked in May and September. Most salmon were in the 8 to 14lbs size class. The proportion of smaller salmon in the catch fell again, probably reflecting the continued decline of grilse.
- Adult stock status for Usk salmon will remain 'At Risk'. Average abundance of salmon fry at annual monitoring sites has now been low for seven years.
- Other than the recent lack of adults, there is no clear understanding of why salmon are doing so poorly in the Usk compared to some other rivers. It is not only salmon that is in trouble. Much of the ecology of the Usk is degraded and deteriorating.
- The salmon fishery is on its last legs and it is not clear how long the Usk will have a viable population. Unless there are major improvements in salmon survival over its life cycle in the river and sea, recovery seems improbable.

A 10lbs salmon from the lower Usk in early May before flows dropped and temperatures rose. (*Photo: Russell Scott-Lawton*)

1. River conditions: In contrast to last year, much of the 2023 season was wet providing good flows for salmon migration and angling. Unfortunately, there were low flows and, at times, high temperatures when the main run was expected from mid-May to mid-July.



In summary:

March/April: Flows were quite low for the first week of the season but rose and remained high, mostly too high for fishing, until the second half of April.

May/June: Other than a small spate in May which would have helped smolt migration, flows remained low to mid-July.

Regrettably, the Canal and Rivers Trust's abstraction to the canal at Brecon was still not supported by releases from Usk reservoir and so continued to significantly reduce the river flow. The Trust has appealed to Welsh Government against the conditions in the new abstraction licence and until that is resolved, it does not have to comply. There is still no date yet for the appeal to be heard.

Many fisheries closed from 14 June during a hot spell when the average water temperature at NRW's Trostrey gauge exceeded 20°C. They reopened on 30 June when it dropped back to below 18°C though flows did not increase significantly.

July/August: The second half of July and August were wet generating a sequence of small spates that provided excellent conditions for migration and angling until flows fell again at the end of the month.

September/October: Flows were low at the beginning of September when shrimp and prawn fishing is permitted under byelaws. Unlike fly fishing or spinning, this method can be very effective under low flows. In allowing it from 1 – 15 September, NRW had anticipated that water temperatures at this time would be low enough, below 18°C, for safe catch & release. As in 2021, that was not the case this year. Average water temperatures at NRW's Trostrey gauge exceeded 18°C from the 6th to

12th. Rob Kerby recorded a temperature of over 21°C on the 7th in the afternoon just downstream of Usk. Some fisheries again closed for salmon fishing from the 6th September, reopening on the 14th.

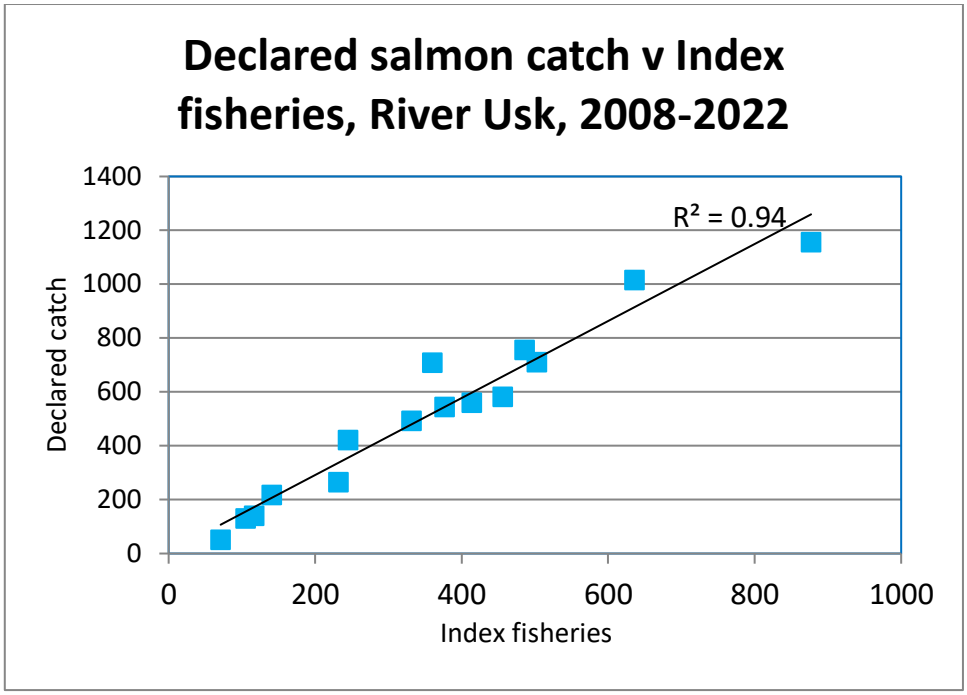
Date Sept '23	Average daily temperature °C at NRW's Trostrey gauge	Average daily temperature °C at NRW's Trallong gauge
6	18.37	16.27
7	19.29	16.61
8	19.64	17.08
9	20.09	17.70
10	20.06	17.20
11	19.79	16.93
12	18.99	16.59
13	17.70	15.29

There was a big spate, 3 metres on the Chainbridge gauge, on 20th September after which conditions remained generally good for migration and angling so good catches would have been expected in the middle and upper reaches.

2. Rod catch of Usk salmon

2.1 **Seasonal totals:** Catches were provided for 'Index fisheries' in the middle and lower reaches, i.e. Upper Llangybi; Lower Llangybi (from David Addams-Williams); three Merthyr Tydfil AA fisheries (from Tony Rees and Gary Davies); Monkswood (from Helen Harrison); Llanover (from Ross Murray); the Usk Town Water (Chris Brain) and Isca AC's three fisheries (from Andrew Beattie). Together these totalled 60, lower than the 71 last year, when the Usk recorded its lowest ever rod catch.

2.2 Salmon licence holders are required to make individual catch returns to NRW by the end of December. Not all do, but these 'declared' catches are used by NRW, with some adjustment, to assess stock status. There is a strong correlation between the catches at Index fisheries and the declared catch. Usually, the catch recorded by fishery owners and clubs at the index fisheries is less than that declared by anglers to NRW on their licence returns. For some reason or reasons, that was not the case in 2022 when the catch recorded by NRW was only 51 compared to a catch at index fisheries of 71. However, this anomaly makes little difference to the long-term relationship between the two.

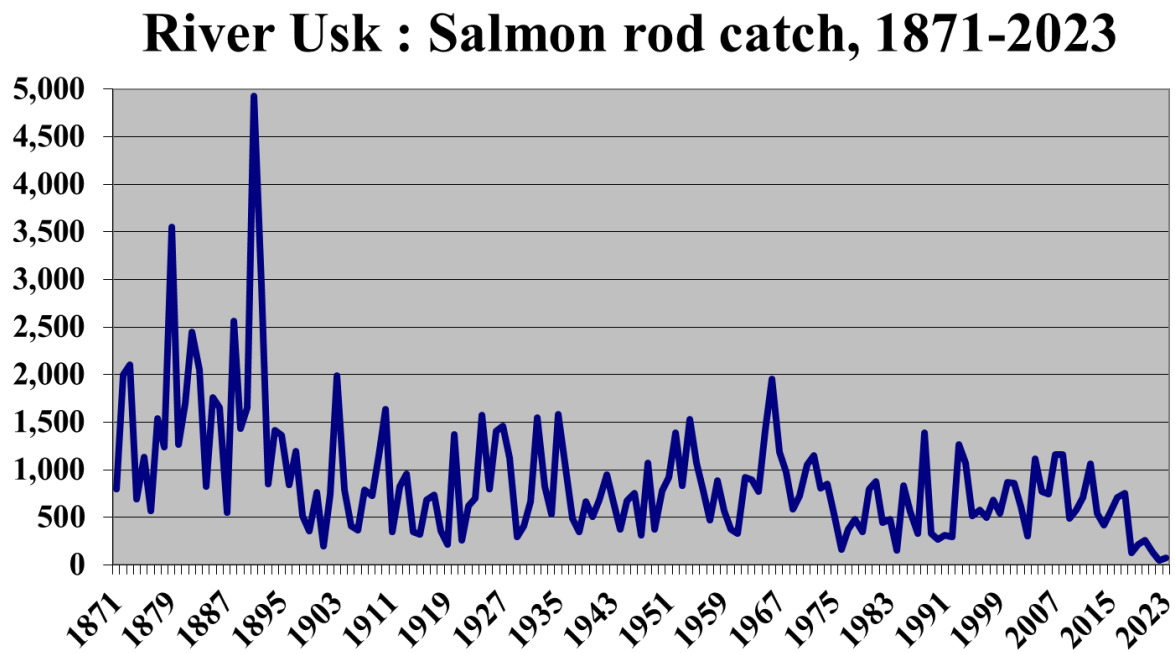


	Salmon catch Index fisheries	Declared Usk catch	Index catch as a Proportion of Declared Usk catch
2008	877	1156	76%
2009	332	491	68%
2010	456	580	79%
2011	360	707	51%
2012	636	1014	63%
2013	377	543	69%
2014	245	421	58%
2015	414	559	74%
2016	503	709	71%
2017	486	756	64%
2018	105	129	81%
2019	141	216	69%
2020	232	263	88%
2021	117	140	84%
2022	71	51	139%
2023	60	**Predicted: 78 Range: 68-94**	5-year average to 2021: 77% Range:64% to 88%

2.3 Ignoring the anomaly last year, the catch recorded at the Index fisheries over the previous five years has, on average, been 77 percent of the catch declared by anglers to NRW, ranging from 64 to 88 percent. The catch at the Index fisheries in 2023 can therefore be used to estimate the

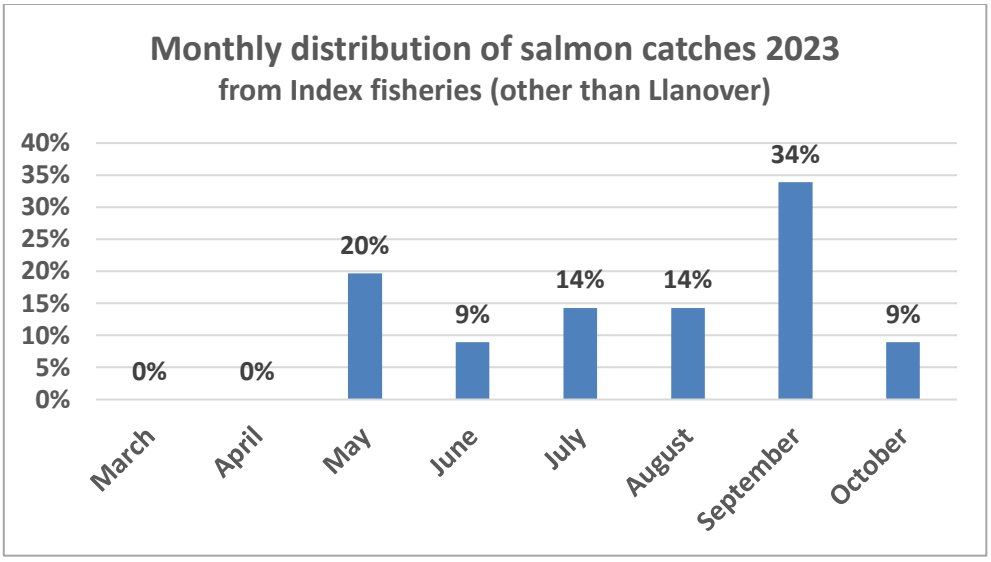
catch that will be declared to NRW this winter and reported next year. For the 2023 season, the declared catch is predicted to be about 78, between 68 and 94. This will be the second lowest on record since 1871. The lowest to date was 2022. The last six years' catches have all been low, though 2020 was reduced by low fishing effort due to Covid restrictions.

2.4 Partial or complete catches in 2023 have been supplied for a number of other Usk fisheries: Crown Fishery (Mike Cowburn), Gwent Anglers (Rob Kerby), Glanusk (Tiggy Pettifer), Brecon A.S. (Ian Williams), Crickhowell & District AS, and the Ithon Fishery (Mark McCloy). Together with the total for the Index fisheries, these give a minimum actual rod catch of 82 for the whole river in 2023.

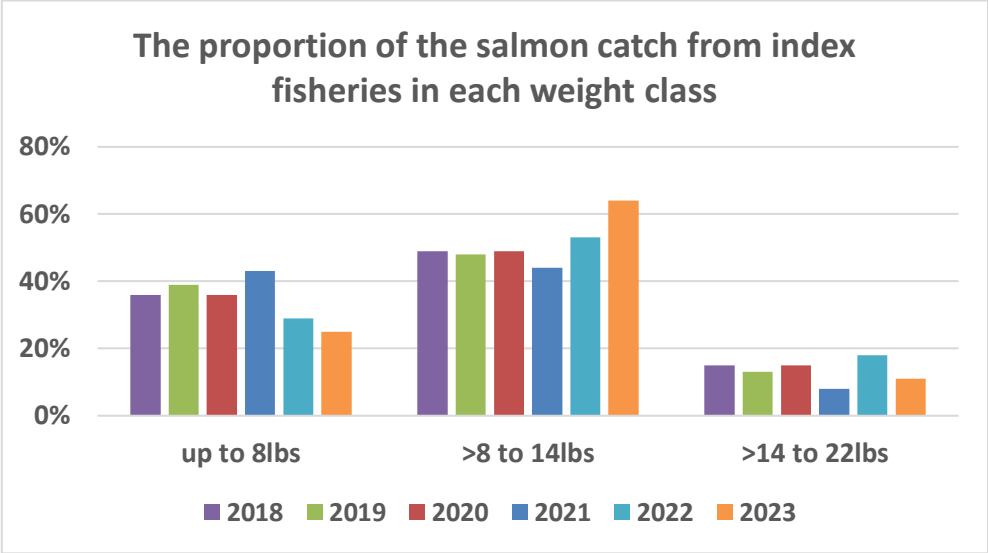


Above: The declared rod catch for the Usk was measured in the thousands in the 19th century and exceeded a thousand several times early this century before the recent collapse. It is now measured in scores. The estimated declared catch of 78 is used for 2023.

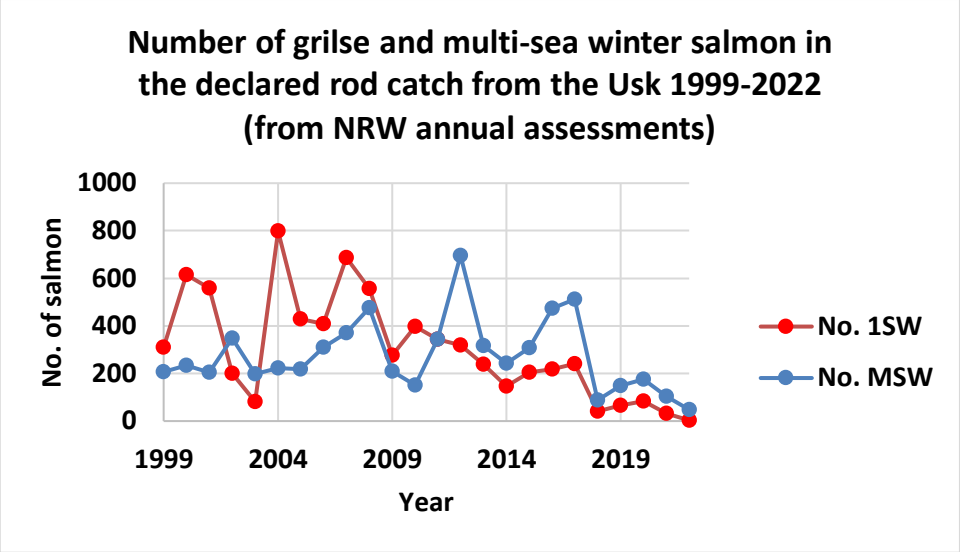
2.4 **Distribution of catch through the season:** The first salmon of the season was a 16-pounder caught in April by Tom Hannon at Chainbridge. Anglers fishing the tidal reaches caught some fish as flows declined in May and early June, before the hot weather set in. Catches picked up again in July and August with cooler, wetter weather. Most salmon were caught in September even though the first half of the month was again hot and dry. Bait fishing, which can be effective under low flows, is permitted under byelaw from 1st to 15th despite the risk to fish survival at high water temperatures. Flows were higher and good for other angling methods later in the month and most of October before the season ended on the 17th. There was no indication of a large late-season run. For the Index fisheries in 2023, October was relatively unproductive with 9 percent of the season's catch. Over the previous five years, October had provided between 21 and 31 percent of the season's catch declared to NRW.



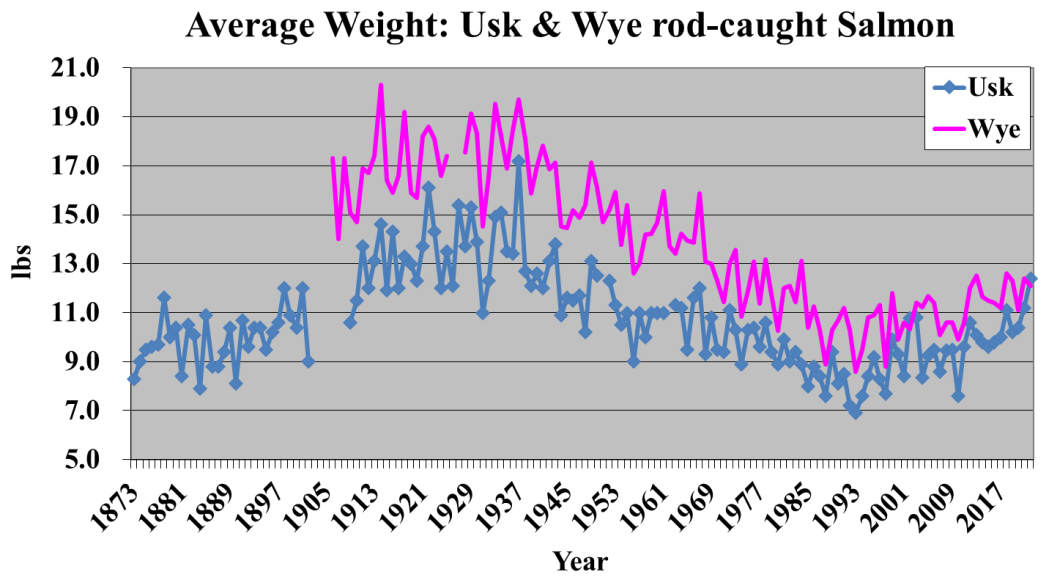
2.5 **The size of salmon caught:** The 56 salmon caught at Upper Llangybi, Lower Llangybi, and the Isca AC fisheries had an average weight of 9.9 lbs. This is down on last year's average of 11.1 lbs. Most salmon were in the 8 to 14lbs size class. The proportion of smaller salmon in the catch fell again, reflecting in part fewer grilse.



2.6 Grilse, which spend only one winter at sea, dominated the declared rod catch in the early part of this century with a peak of 798 in 2004. As shown below, the number caught has since declined to a handful. In contrast, the catch of larger, multi-sea-winter salmon had been increasing before the drop in catches in 2018.



2.7 The decline in grilse abundance is not confined to the Usk and reflects changes in the marine environment linked to climate. Such declines have occurred before and have been followed by a period of increased abundance and size of multi-sea-winter salmon, associated with fluctuations in the ocean climate. These changes are reflected in the average weight of rod-caught salmon, see below. The last period of low salmon abundance, both grilse and multi-sea-winter, was at the start of the last century. Runs were subsequently dominated by large, early-run salmon in the 1920s and 1930s. In 1937, the average weight of rod-caught salmon from the Usk was over 17lbs. Whether historical cycles will be repeated seems uncertain given the impact of man-made climate change on the North Atlantic.



2.8 The recent upturn in average weight, and prior to 2018, the abundance of multi-sea-winter salmon in the Usk follow measures introduced in the 1990s to reduce the number of multi-sea-winter salmon killed in rod and net fisheries.

2.9 **Run-timing:** As in recent years, there seemed to be few fresh salmon, even grilse, caught after July. Presumably most salmon destined for the Usk now arrive in the Severn Estuary in late spring and early summer. It was unfortunate that that in 2023 this coincided with a spell of dry, hot weather resulting in salmon being unwilling to enter the river, possibly until the autumn. Tagging studies suggest that even in the absence of net fisheries, losses of salmon delayed in estuaries can be substantial.

3.0 Adult stock status

3.1 The level and trend in estimated egg deposition over the last ten years is used by NRW to assess the current and future status of the salmon stock. As in 2021, NRW assessed the Usk as 'At Risk' of failing its management objective in 2022 with a similar assessment predicted for 2027. For more detail see page 71 in:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182914/SalmonReport-2022-summary.pdf

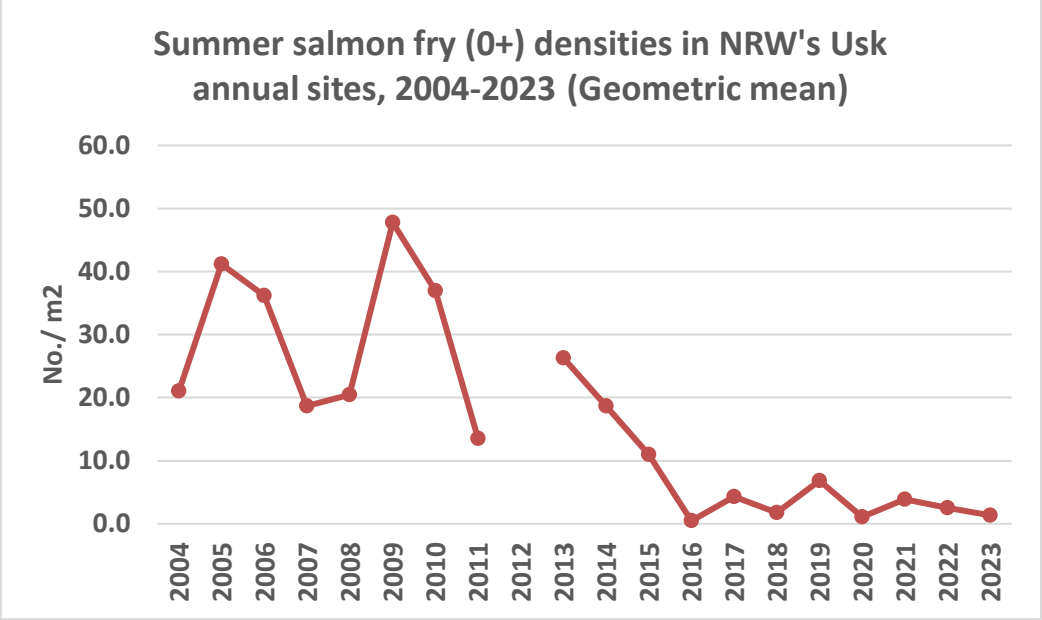
3.2 NRW has used the predicted rod catch in 2023 (from 2.2 above) and the weights of salmon caught at Index fisheries to make an initial assessment of the adult stock for 2023. Given the poor catch and downward trend in recent years, the Usk salmon stock will again be classed as at 'At Risk'.

3.3 NRW estimates that anglers catch about 8 percent of the total salmon run on average. The estimate is based on recent exploitation rates recorded by NRW in the Welsh Dee which has similar rod fishing byelaws to the Usk. This indicates a run into the Usk this year of about a thousand salmon. It will be helpful to have a fish counter operating next year to validate the size of the run.

4.0 Juvenile stock status

4.1 NRW has 13 electrofishing sites on the catchment upstream of Crickhowell that it has surveyed annually in the summer since the 1980s. These sites were selected to be important nursery areas for salmon. All are on the lower part of tributaries except one that is on the very top of the main river. This is not to suggest that the tributaries produce all the juvenile salmon in the Usk. The tributary sites were selected because of the sampling method used. The main river is, or should be, an important nursery area as well.

4.2 These annual surveys show that for the last seven years, average densities have been persistently low in these sites, and a now a small fraction of those before 2014. In 2022, 7 of the 13 sites had no salmon fry. This year there was a slight improvement but fry were again absent from the four sites on the Yscir, Honddu, and Menascin, and Grwyne Fawr.



Data from NRW, except 2020 when, due to Covid, the sites were fished by the Wye & Usk Foundation. No survey in 2012.

4.3 The decline may reflect, to some degree, the decline in the grilse run. However, judging by the rod catch of multi-sea-winter fish there was no overall shortage of adult salmon in 2016 or 2017 that would explain the lack of salmon fry in 2017 and 2018. That paucity of fry will be due to factors in the river, rather than at sea, and requires explanation. The desperately poor runs of salmon since 2018 is now one factor that could account for low juvenile numbers from 2019 onwards.

4.4 NRW commissioned analysis[1] of juvenile salmon abundance in major Welsh rivers from 2001 to 2017. This identified that both extreme temperature or flows could deplete fry abundance. 2016 was a clear case. There were exceptionally high temperatures at spawning time and low temperatures when fry emerged, also high floods before and during the time when fry emerged from the gravel. All were followed by low numbers of fry in the summer. However, neither extreme temperatures nor flows seem to account for low salmon fry abundance in 2017 or 2018. Further analysis using data local to the Usk is still needed to understand the recent impacts of extreme flows and temperature on abundance.

4.5 Not every river has seen a similar collapse in stocks. For example, the juvenile and adult stock in the river Frome in Dorset have seen much smaller declines proportionately, compared to the Usk. The Frome is monitored by the Game Conservancy Trust which operates a fish counter and assesses the number of juvenile salmon fry in the autumn in the whole river[2].

[1] Stephen D. Gregory, Victoria E. Bewes, Andrew J.H. Davey, Dylan E. Roberts, Peter Gough, Ian C. Davidson. 2020. Environmental conditions modify density-dependent salmonid recruitment: Insights into the 2016 recruitment crash in Wales. Freshwater biology 2020 v.65 no.12 pp. 2135-2153: https://onlinelibrary.wiley.com/doi/10.1111/fwb.13609

[2] Game Conservancy Trust Fisheries Research Reports: https://www.gwct.org.uk/fishing/research/fisheries-research-reports/

4.6 Before 2015 there was a good correlation between the average abundance of fry at NRW's annual electrofishing sites in the Usk and the abundance of autumn fry in the Frome. However, from 2015 the relationship broke down indicating that different factors are now affecting salmon recruitment in the two rivers.

4.7 The Frome is a chalk stream with comparatively stable flows and temperatures compared to the Usk. Analysis by the Game Conservancy Trust[3] has shown that while the recruitment in the Frome is affected by temperature, it is not depleted by floods just before and after salmon fry first emerge from the gravel, as has been the case in rainfed rivers such as the Usk. There may, however, be other factors at play. One of these now is the lack of adult fish to spawn in the Usk.

5.0 The state of the riverine environment

5.1 It is not just the salmon stock that is in trouble. Much of the river Usk's ecology is degraded, including all the designated features of the river as a Special Area of Conservation. For example, water crowfoot (Ranunculus), important for fish habitat has been lost from almost the whole of the main river. The degradation of the Usk is described in a report published in 2021:

https://afonyddcymru.org/a-dying-river-the-state-of-the-river-usk/

Since then, NRW's monitoring shows further degradation in the ecological status of the river despite previous NRW plans to improve or at least maintain it. The 2021 assessment found that 65 percent of the water bodies in the Usk catchment failed to reach even 'Good Ecological Status', under the Water Framework Directive, compared to 50 percent in the previous assessment.

5.2 Though much attention is given by NRW to excessive phosphorus, the main reason for water bodies failing to reach Good Ecological Status in the Usk catchment is poor fish populations, principally salmon and trout. It is not clear that the reasons for these failures have been identified or if effective actions can and will be taken to address them. Without this, much of the Usk catchment will continue to fail to meet the objectives of the Water Framework Regulations 2017.

[3] Marsh, J.E. et al (2021): Warm winters and cool springs negatively influence recruitment of Atlantic salmon (Salmo salar L.) in a southern England chalk stream. Fish Biol. **99**, Issue 3, 1125-1129 https://onlinelibrary.wiley.com/doi/abs/10.1111/jfb.14760

6.0 Prospects for the future

6.1 With the salmon rod catch at an all-time low and sustained low abundance of salmon fry at NRW's survey sites, the future for salmon in the Usk looks bleak. The salmon fishery is on its last legs and it is not clear how long the Usk will have a viable salmon population given recent trends. Unless there are major improvements in salmon survival over its life cycle in the river and sea, recovery seems highly improbable.

Acknowledgements

Thanks to all who contributed information, especially those who provided catch data for their fisheries so promptly; to the Wye & Usk Foundation for their 2020 survey data; and to NRW for various data and stock assessment. Particular thanks to Andrew Gott and Paul Greest (NRW) for providing the 2022 juvenile data and to Paul Greest and Ian Davidson (NRW) for turning round the stock assessment so quickly.